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ABSTRACT

This paper discusses computer based virtual field trips that use technologies commonly found in public schools in the United States. The discussion focuses on the advantages of both using and creating these field trips for an instructional situation. A virtual field trip to Cumberland Island National Seashore, St. Marys, Georgia is used as a point of discussion for the technologies involved and the value of their use for instruction in a science classroom. While this field trip is being used as a point of discussion, the techniques and advantages identified can be applied over a P-16 grade range in all subject areas. If the decision is made by an instructor to create a virtual field trip, the technologies used can be as simple as using digital pictures and text in Microsoft PowerPoint or Hyperstudio or as complex as using digital video and panoramas in Macromedia Director. The level of complexity will depend on the technology available and skills of the developers. (Author)

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Computer Based Virtual Field Trips

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Abstract: This paper will discuss Computer Based Virtual Field Trips that use technologies commonly found in public schools in the United States. The discussion will focus on the advantages of both using and creating these field trips for an instructional situation. A virtual field trip to Cumberland Island National Seashore, St. Marys, GA will be used as a point of discussion for the technologies involved and the value of their use for instruction in a science classroom. While this field trip is being used as a discussion point, the techniques and advantages identified can be applied over a P-16 grade range in all subject areas. If the decision is made by an instructor to create a virtual field trip, the technologies used can be as simple as using digital pictures and text in Microsoft PowerPoint or Hyperstudio or as complex as using digital video and panoramas in Macromedia Director. The level of complexity will depend on the technology available and skills of the developers.

Virtual field trips are a hot buzzword for integrating technology into the curriculum. If one does a web search using "Virtual Field Trip" as a key phase, hundreds of sites will be identified. These sites are overwhelmingly web based and provide an abundance of pictures with limited information about locations that are deemed to have educational value. Krupnick, states that, "The Web is now crowded with sites that are considered 'Virtual Field Trips' and they vary a great deal in content and usefulness." She further states that, "For teachers who already have a curricular unit assembled and are looking for online enhancements, these are adequate. But for teachers who are looking for a source of new and exciting curriculum such sites are only a starting point. In order to make them useful, an instructor would need to develop curriculum." (2000, p. 43)

The approach taken in this paper is that a virtual field trip is much more than a web-based presentation of a location. Our focus is to show how to design a field trip based on curriculum content that allows the student to "learn" from the field trip in a way that is similar to actually taking the field trip. Coulter states, "The key is for (instruction) to drive the technology implementation and not vice versa, despite pressures to integrate technology into the classroom.... virtual field trips ... enable students to refine and extend their growing understanding as they explore other parts of the world." (2000, p. 49)

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In educational situations actual field trips need to be more than "just a day away from school," with limited tangential educational purpose. They should be as real a connection to the "real world" as possible. A normal day field trip does not offer sufficient time to take full advantage of all a site has to offer. Bellan and Sheurman (1998) discuss ideas about actual and virtual field trips and state pitfalls of both. Their article outlines the teacher involvement necessary to alleviate some of the pitfalls. Among these are a teacher visiting both the actual and virtual sites, the teacher's plan for student use of a virtual site, student use of the virtual site before visiting actual sites, and follow up instruction using both the virtual and actual trip experiences. Taking the field trip on the computer does not eliminate all the concerns about how field trips are used. The virtual field trip is usually not sufficient by itself. Pre-planning the trip and the follow-up experiences should be addressed as part of the teacher's curriculum. In addition we suggest a virtual field trip should be developed by the teacher to be used in connection with an actual field trip to the site.

Definition of a Virtual Field Trip

Virtual field trips as referred to in this paper, are computer-based simulations of an actual field trip, which allows the user to vicariously experience the environment of the intended location. They provide the teacher and learner the opportunity to explore aspects of an actual trip without leaving the classroom. They should include all elements of a well-designed field trip and provide the student with experiences that are beyond those that could be obtained from a pamphlet about or a photo display of the location. Stainfield, Fisher, et. al. (2000) feel that virtual refers to "digital alternative representations of reality" and that a virtual field trip is not an attempt to create a virtual reality.

The Power of Instructor Designed Virtual Field Trips

Instructors can create their own virtual field trip with their students by using a digital camera. By planning what they would like to include, the field trip can be designed to meet the objectives of the specific instructional situation. The site used for the virtual trip can be one that is within the student's local community. Choosing a site that can be visited by the class or a student's family will vastly increase the educational value of the experience. This requires that teachers must have control in creating the trip to meet their curricular needs. Student involvement in the creation of the virtual field trip can give power to the experience. This can take the form of; collecting information at school, using aspects of the technology in the construction of the product, taking the actual field trip and gathering the images and information that is presented in the virtual field trip. This type of involvement focuses student's attention and learning on the intricate aspects of the content presented. In addition it provides ownership by the students of the project and focuses their learning of the curricular content. Last, but not least, it provides opportunities for students to use the technology in a real world situation, which addresses the NETS standards by preparing them to function in a technology rich information society.

Advantages of Creating a Virtual Field Trip

The main advantage of a virtual field trip is that it can be used to meet the objectives of the curriculum and the needs and ability levels of the students. Other advantages include:

- providing opportunities for repeated visitations to the site for continued study.
- allowing the teacher to focus on one specific aspect of the trip at a time.
- providing for the presentation of a wider variety of experiences than may be possible on one trip.
- illustrating time sensitive issues that could not be viewed on a single actual trip.
- allowing classes in a different geological location to visit and compare with resources in their own area.
- providing integration of the multiple aspects of the field trip into a number of different curriculum areas.
- allowing for commonality of experiences by all participatents.
- allowing students to take a closer look at areas that could not be fully explored during an actual field trip.
- using for assessment purposes.
- sharing with colleagues and parents.

• using repeatedly by the teacher year after year.

When teachers use a virtual field trip in conjunction with an actual field trip to the same site, a virtual trip can serve as a motivator for the trip, or as an advanced organizer for the day's activities. It also encourages learners to plan and prepare for activities to be carried out on the trip or can provide a simulation for students who may not have been able to attend the actual field trip.

Limitations of a Virtual Field Trip

There are two major limitations to using a virtual field trip. The first is the availability of a field trip that meets the objectives of the curriculum. Commercially available and Web based field trips are designed for a large audience and may need to be adapted to meet an individual instructors curriculum needs. The second limitation focuses on the designer's expertise in the content area and appropriate pedagogy for the field trip.

Barriers, and the Paths over Them

The main limitation in creating a virtual field trip is the time needed to create the experience. The teacher who wants to create a virtual field trip needs to find ways of involving others such as; colleagues, community members, students and parents. If the teacher views the design of the field trip as dynamic, constantly evolving, construction of both the actual and virtual field trips will grow over time.

Because curriculum design requires content expertise, another limitation is the creator's knowledge of the content area of the field trip and the curricular objectives. As teachers become involved with the design they often need to extend their content knowledge, thus increasing the time necessary to design the experience. On the positive side, they can get so involved that their personal knowledge increases and it becomes a professional development experience.

A third limitation is the availability of the technology. However with the increasing availability of technology in the schools, homes and work places this is becoming less of a barrier. Coupled with the availability of the technology is the teacher's ability to use the technology effectively. Again this can become a learning situation and thus increases the time to create the product. This limitation can be minimized by the involvement of colleagues, community members, students and parents.

Creating a Virtual Field Trip

The general steps for creating a virtual field are:

1. Examine objectives of the course and choose a field trip that includes experiences that fit within the realm of the objectives and enhances learning.

The purpose of a virtual field trip may meet multiple objectives: to learn specific content, to experience a new venue, or to develop skills in documenting experiences and using technology.

2. Create a concept map of the experiences to be included in the fieldtrip.

A concept map provides an overview of all the elements to be included in the virtual field trip and acts as an organizing framework to build upon in construction of the final product. The concept map should not be considered the final blueprint for the field trip; rather it should be seen as a dynamic overview and a starting point from which the product evolves.

3. Select the appropriate technology to be used based on the content and the curricular objectives of the trip. The technology includes the organizing program and tools for collecting and presenting data.

The equipment and software used will depend on the complexity of the trip and the grade level of the students. Virtual field trips can vary in their complexity based upon the experience of the creator with the technology available.

4. Collect and organize materials to be included based on the curriculum objectives to be accomplished and the concept map.

Examples of desired materials might be: a) still pictures, both digital and photographs; b) videos; c. text; d) databases and graphs; and e) sound clips.

As materials are collected and organized decisions must be made. For example, panoramic videos can be used to give an overview of the location. If panoramas are to be used, decisions will have to be made beforehand as to the location and the concept to be illustrated.

5. Convert all materials to digital format.

When converting materials to digital format the question of designing for dual platforms (Windows and Mac OS) must be considered. While designing for dual platforms is not more difficult or time consuming, the decisions made about the format of the individual parts (pictures and text) must be considered to insure that they are appropriate for the platform(s) chosen. Making these decision early eliminates converting work later. Materials not in digital format need to be digitized.

6. Assemble all elements in the organizing program based on the concept map.

Here decisions on the format that the field trip will be presented in must be made. Will it be one stand-alone program presentation or a series of parts that can be accessed separately? Also, before assembling the materials one must consider the platforms that can present the materials . Will the field trip best meet the needs of the teacher if it is dual platform or is one platform sufficient? These decisions along with the assembler's knowledge of presentation programs will determine if Macromedia Director, Hyperstudio, Power Point or any of the other available authoring programs meet the needs of the designed field trip. The choice of the authoring program used is often the assemblers personal choice based on familiarity and skill with the program.

7. Evaluate the finished product to be sure it meets the objectives.

In a teacher created product, evaluation should be formative in nature, providing a continuously changing and evolving product. There will always be questions of; how could we do this better? what can be added to it? what are the differing needs of the learners using it? and how can each learner group add to the information presented?

When evaluating the effectiveness of a virtual field trip one should consider both the appropriateness and the effectiveness of the technology used in the presentation of the content. Children frequently experience learning situations indirectly thought technology by the use of pictures, time-lapse photography and interactive non-linear experiences that allow the learner to follow their interest and to revisit locations in the program as their interest grows. Technology should not be seen as a replacement for experiences but as an enhancement of these experiences. Technology can be used to enhance the senses, build interest and excitement or to review and analyze experiences. Digital cameras provide the technology necessary to; record experiences for later analysis without damaging the environment, document cause and effect relationships, record changes over time, document unique events, record images that give historical perspectives, open vistas of limited access to all learners, and reviewing and analyzing experiences.

We chose to illustrate the process of creating a virtual field trip within a course for Middle Grades pre-service teachers. Its objectives are to prepare the pre-service teachers to; 1) design and use field trips effectively in their classrooms, 2) effectively develop technology use and skills in their students and 3) illustrate an integrated curriculum approach to learning.

The *Cumberland Island National Seashore: Virtual Field Trip* (Clark, et al, 2002) has been effective in motivating our middle school pre-service teachers in several ways. The students actually look forward to getting up at 5 a.m. for a 6 a.m. departure and walking in the sun/rain/wind/heat/cold for twelve or more hours before returning home. The students are more attuned to the sites they will see and participate in activities on the island. For example;

- upon reaching the beach instead of thinking of swimming, they look for live buried shells.
- they have thought about the mathematics of figuring out a tree's canopy coverage, or a fountain's volume, and proceed with the task.
- they know what plants and animals are to be found and set about searching for them.
- they know how to use the digital camera to document necessary aspects of an unknown phenomena for later study or life form for later identification in their field manuals.
- they look for signs of man's influence on the environment and history of the area.
- they look for signs of the destructive effects of the feral horse and hog population on the environment.
- in the marsh and bogs they look more closely at the smaller forms of wildlife.
- they have a stronger awareness of what goes into a quality learning experience.
- upon returning from the actual trip they note what they saw, what they did not see, and organize their data and experience into a technology enriched presentation.

Conclusion

We feel that a virtual field trip that resides on a storage medium and not on the WWW has advantages in its effectiveness. The program is not dependent on access to or the vagaries of the Web, it runs faster, it is always accessible, and it focuses the student's attention on the task at hand.

This paper uses the terms teacher created, creator, and assembler in an apparently interchangeable manner. This is due to the principle that while the teacher is the driving force in the design and creation of the virtual field trip; the tasks can be done in conjunction with students, parents, interested community members and colleagues. The technologies used to develop and create virtual field trips are commonly found in public schools today. This process of creating virtual field trips can be as simple as using digital pictures and text in Microsoft Power Point or Hyperstudio or as complex as using digital video and panoramas in Macro Media Director. The technology skills necessary in the creation of the field trip all are within the scope of the National Educational Technology Standards (NETS) for Teachers, and many are within the scope of the NETS for students.

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